# MEATS

## Contest Overview

The meat industry is an important component in Missouri agriculture. The Meat Identification and Judging Contest has been developed to encourage secondary agriculture students to develop skills and abilities needed to enter and advance in careers in the meat industry.

## Contest Objectives

The State Agriculture Meat Identification and Judging Contest is designed to:

1.  develop employment knowledge for students who are interested in exploring and pursuing a career in the meat industry.

2.  aid the local agriculture instructor in motivating students to become involved in the industry of animal marketing and merchandising.

3.  encourage the development of broader analytical skills, critical thinking strategies, and an understanding of appropriate meat terminology for high school students.

4.  develop the students' ability to evaluate meat animal products in order to optimize economic returns to producers and industry as well as to meet the needs of the consumer.

## Contest Format and Scoring

The contest will consist of three sections:

I.    Identification of Retail Cuts of Meat (240 points). Various retail cuts of meat, 40 in number (beef, pork, lamb), and variety meats (as liver, tongue, etc.), will be placed in a convenient manner and given an identification number. The contestant will write in the number opposite the name of the cut on the scorecard. Approximately one minute for each cut will be the time allowed for identification.

II.   Judging Classes of Meat

1.  (200 points). Four classes will be judged. The classes will consist of four exhibits of beef, pork, or lamb carcasses or wholesale or retail cuts of beef and pork. Wholesale cuts may include fresh hams, pork loins, pork Boston shoulders (butts), pork picnic shoulders, beef ribs, beef chucks, beef loins, beef rounds, beef strip loins, and beef rib eye.

2.  (50 points). Ten questions will be required on one of the judging classes. The format will be a 50 point multiple choice/true-false test relating to placing the class.

Example: Which rib eye has the highest degree of marbling?
(a) 1 (b) 2 (c) 3 (d) 4.

III.      Test (60 points).  The test will consist of 20 multiple choice questions based on the Meats Units available from IML.

IV.      Meats formulation problem (50 points).

See pages 2-4 National Career Development Events Meat Evaluation and Technology Section for details (sample included on following pages).

## Contest Rules

1.      <u>Contestants must not communicate with each other while the contest is in progress.</u>

2.      All coaches, alternates, and others, except the superintendent, his/her assistants, contestants, and the judges will be excluded from the Meats Laboratory.  Any assistance given a team member from any source during the contest will be sufficient cause to eliminate that team from the contest.

3.      Official placing and discussion of classes will be held immediately following the contest.  Instructors, contestants, alternates and other interested persons are encouraged to attend.

4.      Contestants should come prepared to work in a room temperature of $40^{\circ}$F. They should have heavy sweaters, coats, or other warm clothes.

5.      In the retail cut identification class, using Form 7, six (6) points will be given for each cut that is correctly identified.  The perfect score for the identification class is 240 points, and for each of the placing classes, the perfect score is 50 points.

## References

National Association of Meat Purveyors (1988).  <u>The Meat Buyers Guide</u>.  8365-B Greensboro Drive, McLean, VA  22102; <u>Phone</u>:  (703) 827-5754.

National Live Stock and Meat Board.  <u>Uniform Retail Meat Identify Standards</u>. Department of Merchandising, National Live Stock and Meat Board, 444 North Michigan Ave., Chicago, IL  60611.

<u>Introduction to Animal Products</u> (1998).  IML, 2316 Industrial Drive, University of Missouri, Columbia, MO  65202. (800) 669-2465 <u>www.iml.coe.missouri.edu</u>.

Meat Evaluation Handbook.  (National Cattlemen's Beef Association 1997) IML, 2316 Industrial Drive, University of Missouri, Columbia, MO  65202.  (800) 669-2465 www.iml.coe.missouri.edu.


Meat Judging and Grading Revised 1998.  IML, 2316 Industrial Drive, University of Missouri, Columbia, MO  65202.  (800) 669-2465 www.iml.coe.missouri.edu.


Meat Judging: Fundamentals - Video Active.  IML, 2316 Industrial Drive, University of Missouri, Columbia, MO.  65202.  (800) 669-2465 www.iml.coe.missouri.edu.


National Career Development Events (2001-2005).  National FFA Organization.

# WHOLESALE - RETAIL CUTS CODING

| PRIMAL CUTS | RETAIL CUTS | SPECIES | PRIMAL | RETAIL |
|---|---|---|---|---|
| *BEEF* | | | | |
| ROUND | Bottom Round Roast | B | 10 | 8 |
| | Bottom Round Steak | B | 10 | 48 |
| | Eye Round Roast | B | 10 | 18 |
| | Eye Round Steak | B | 10 | 51 |
| | Heel of Round Roast | B | 10 | 22 |
| | Round Steak | B | 10 | 56 |
| | Round Steak (Bnls) | B | 10 | 57 |
| | Rump Roast (Bnls) | B | 10 | 29 |
| | Tip Roast | B | 10 | 41 |
| | Tip Roast, Cap Off | B | 10 | 42 |
| | Tip Steak | B | 10 | 70 |
| | Tip Steak, Cap Off | B | 10 | 71 |
| | Top Round Roast | B | 10 | 44 |
| | Top Round Steak | B | 10 | 74 |
| LOIN | Porterhouse Steak | B | 7 | 55 |
| | Sirloin Steak (Bnls) | B | 7 | 59 |
| | Sirloin Steak, Flat Bone | B | 7 | 61 |
| | Sirloin Steak, Pln Bone | B | 7 | 62 |
| | Sirloin Steak, Round Bone | B | 7 | 63 |
| | Sirloin Steak, Wedge Bone | B | 7 | 64 |
| | T-Bone Steak | B | 7 | 68 |
| | Tenderloin Roast | B | 7 | 40 |
| | Tenderloin Steak | B | 7 | 69 |
| | Top Loin Steak | B | 7 | 72 |
| | Top Loin Steak (Bnls) | B | 7 | 73 |
| | Top Sirloin Steak (Bnls) | B | 7 | 75 |
| FLANK | Flank Steak | B | 3 | 52 |
| RIB | Eye Roast | B | 9 | 17 |
| | Eye Steak | B | 9 | 50 |
| | Roast, Large End | B | 9 | 23 |
| | Roast, Small End | B | 9 | 37 |
| | Small End Steak | B | 9 | 66 |
| | Small End (Bnls) | B | 9 | 67 |
| CHUCK | Arm Pot Roast | B | 2 | 3 |
| | Arm Pot Roast (Bnls) | B | 2 | 4 |
| | Arm Steak | B | 2 | 45 |
| | Arm Steak (Bnls) | B | 2 | 46 |
| | Blade Roast | B | 2 | 6 |
| | Blade Steak | B | 2 | 47 |
| | Chuck Eye Roast (Bnls) | B | 2 | 13 |
| | Mock Tender Steak | B | 2 | 53 |
| | Mock Tender Roast | B | 2 | 25 |
| | Seven (7) Bone Steak | B | 2 | 58 |
| | Seven (7) Bone Roast | B | 2 | 31 |
| PLATE | Short Ribs | B | 8 | 33 |
| | Skirt Steak (Bnls) | B | 8 | 65 |
| BRISKET | Brisket (Whole, Bnls) | B | 1 | 10 |
| | Brisket, Corned | B | 1 | 93 |
| | Flat Half (Bnls) | B | 1 | 19 |
| | Point Half (Bnls) | B | 1 | 26 |
| SHANK | Cross Cuts | B | 11 | 15 |
| | Cross Cuts (Bnls) | B | 11 | 16 |

| PRIMAL CUTS | RETAIL CUTS | SPECIES | PRIMAL | RETAIL |
|---|---|---|---|---|
| VARIETY MEATS | Heart | B | 15 | 85 |
| | Kidney | B | 15 | 86 |
| | Liver | B | 15 | 87 |
| | Oxtail | B | 15 | 88 |
| | Sweetbread | B | 15 | 89 |
| | Tongue | B | 15 | 90 |
| | Tripe | B | 15 | 91 |
| VARIOUS | Beef for Stew | B | 16 | 92 |
| | Cube Steak | B | 16 | 94 |
| | Ground Beef | B | 16 | 95 |
| **PORK, FRESH** | | | | |
| LEG | Center Slice | P | 6 | 49 |
| | Rump Portion | P | 6 | 30 |
| | Shank Portion | P | 6 | 32 |
| LOIN | Blade Roast | P | 7 | 6 |
| | Back Ribs | P | 7 | 5 |
| | Blade Chop | P | 7 | 77 |
| | Butterfly Chop | P | 7 | 78 |
| | Center Loin Roast | P | 7 | 11 |
| | Center Rib Roast | P | 7 | 12 |
| | Country Style Ribs | P | 7 | 14 |
| | Loin Chop | P | 7 | 80 |
| | Rib Chop | P | 7 | 81 |
| | Sirloin Chop | P | 7 | 82 |
| | Sirloin Cutlets | P | 7 | 60 |
| | Sirloin Roast | P | 7 | 35 |
| | Tenderloin Roast | P | 7 | 40 |
| | Top Loin Chop | P | 7 | 83 |
| | Top Loin Chop (Bnls) | P | 7 | 84 |
| | Top Loin Roast Double (Bnls) | P | 7 | 43 |
| SIDE | Fresh Side | P | 13 | 21 |
| | Spare Ribs | P | 13 | 38 |
| SHOULDER | Arm Picnic | P | 12 | 2 |
| | Arm Roast | P | 12 | 3 |
| | Arm Steak | P | 12 | 45 |
| | Blade, Boston | P | 12 | 7 |
| | Blade Steak | P | 12 | 47 |
| VARIETY METS | Heart | P | 15 | 85 |
| | Kidney | P | 15 | 86 |
| | Liver | P | 15 | 87 |
| | Tongue | P | 15 | 90 |
| VARIOUS | Cube Steak | P | 16 | 94 |
| | Ground Pork | P | 16 | 96 |
| | Hocks | P | 16 | 97 |
| | Sausage | P | 16 | 98 |
| | Sausage Links | P | 16 | 99 |
| **PORK, SMOKED/CURED** | | | | |
| CURED HAM | Center Slice | P | 5 | 101 |
| | Ham (Whole) | P | 5 | 102 |
| | Ham Hocks | P | 5 | 103 |
| | Rump Portion | P | 5 | 108 |
| | Shank Portion | P | 5 | 109 |
| LOIN | Canadian Bacon | P | 7 | 100 |
| | Rib Chop | P | 7 | 107 |
| | Loin Chop | P | 7 | 105 |

| PRIMAL CUTS | RETAIL CUTS | SPECIES | PRIMAL | RETAIL |
|---|---|---|---|---|
| SHOULDER | Picnic (Whole) | P | 12 | 106 |
| SIDE (BELLY) | Slab Bacon | P | 13 | 110 |
| | Sliced Bacon | P | 13 | 111 |
| JOWL | Jowl | P | 14 | 104 |
| *LAMB* | | | | |
| LEG | American Style Roast | L | 6 | 1 |
| | Center Slice | L | 6 | 49 |
| | Frenched Style Roast | L | 6 | 20 |
| | Sirloin Chop | L | 6 | 82 |
| | Sirloin Half | L | 6 | 36 |
| | Shank Portion | L | 6 | 32 |
| LOIN | Double Chop | L | 7 | 79 |
| | Loin Roast | L | 7 | 24 |
| | Loin Chop | L | 7 | 80 |
| RIB | Rib Chop | L | 9 | 81 |
| | Rib Roast | L | 9 | 27 |
| SHOULDER | Arm Chop | L | 12 | 76 |
| | Blade Chop | L | 12 | 77 |
| | Neck Slice | L | 12 | 54 |
| | Shoulder (Bnls) | L | 12 | 34 |
| | Square Cut (Whole) | L | 12 | 39 |
| FORESHANK AND BREAST | Breast | L | 4 | 9 |
| | Riblets | L | 4 | 28 |
| VARIETY MEATS | Heart | L | 15 | 85 |
| | Kidney | L | 15 | 86 |
| | Liver | L | 15 | 87 |
| | Tongue | L | 15 | 90 |

## Meat Identification Card - Training Aid

Name: _____   Contestant Number: _____

School: _____   School Number: _____

Select:  Species (1 point), Wholesale Cut (2 points), and Retail Name (3 points) from listings below and fill in the column blanks beside the cut number.  The score column is for tabulation only.  Total - 240 points.

**SPECIES -** 1 point  **B**=Beef  **P**=Pork  **L**=Lamb

| Cut No. | Species | Wholesale | Retail | Score |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| 12. | | | | |
| 13. | | | | |
| 14. | | | | |
| 15. | | | | |
| 16. | | | | |
| 17. | | | | |
| 18. | | | | |
| 19. | | | | |
| 20. | | | | |
| 21. | | | | |
| 22. | | | | |
| 23. | | | | |
| 24. | | | | |
| 25. | | | | |
| 26. | | | | |
| 27. | | | | |
| 28. | | | | |
| 29. | | | | |
| 30. | | | | |
| 31. | | | | |
| 32. | | | | |
| 33. | | | | |
| 34. | | | | |
| 35. | | | | |
| 36. | | | | |
| 37. | | | | |
| 38. | | | | |
| 39. | | | | |
| 40. | | | | |

### Wholesale Cut
### 2 Points

1. Brisket
2. Chuck
3. Flank
4. Foreshank & Breast
5. Cured Ham
6. Leg
7. Loin
8. Plate
9. Rib
10. Round
11. Shank
12. Shoulder
13. Side (Belly)
14. Jowl
15. Variety Meats
16. Various

### Retail Cuts
### 3 Points

**Roasts/Pot Roasts**

1. American Style
2. Arm Picnic
3. Arm Roast
4. Arm Pot Roast (Bnls)
5. Back Ribs
6. Blade Roast
7. Blade, Boston
8. Bottom Round Roast
9. Breast
10. Brisket, (Whole,Bnls)
11. Center Loin Roast
12. Center Rib Roast
13. Chuck Eye Roast (Bnls)
14. Country Style Ribs
15. Cross Cuts
16. Cross Cuts (Bnls)
17. Eye Roast
18. Eye Round Roast
19. Flat Half (Bnls)
20. Frenched Style Roast
21. Fresh Side
22. Heel of Round Roast
23. Roast, Large End
24. Loin Roast
25. Mock Tender Roast
26. Point Half (Bnls)

27. Rib Roast
28. Riblets
29. Rump Roast(Bnls)
30. Rump Portion
31. Seven(7)Bone Roast
32. Shank Portion
33. Short Ribs
34. Shoulder(Bnls)
35. Sirloin Roast
36. Sirloin Half
37. Roast,Small End
38. Spare Ribs
39. Square Cut(Whole)
40. Tenderloin Roast
41. Tip Roast
42. Tip Roast,Cap Off
43. Top Loin Roast Double(Bnls)
44. Top Round Roast

**Steaks**

45. Arm Steak
46. Arm Steak(Bnls)
47. Blade Steak
48. Bottom Round Steak
49. Center Slice
50. Eye Steak
51. Eye Round Steak
52. Flank Steak
53. Mock Tender Steak
54. Neck Slice
55. Porterhouse Steak
56. Round Steak
57. Round Steak (Bnls)
58. Seven(7)Bone
59. Sirloin Steak (Bnls)
60. Sirloin Cutlets
61. Sirloin,Flat Bone
62. Sirloin,Pin Bone
63. Sirloin,Round Bone
64. Sirloin,Wedge Bone
65. Skirt Steak (Bnls)
66. Small End Steak
67. Small End (Bnls)
68. T-Bone Steak
69. Tenderloin Steak
70. Tip Steak
71. Tip Steak,Cap Off
72. Top Loin Steak
73. Top Loin Steak (Bnls)

74. Top Round Steak
75. Top Sirloin(Bnls)

**Chops**

76. Arm Chop
77. Blade Chop
78. Butterfly Chop
79. Double Chop
80. Loin Chop
81. Rib Chop
82. Sirloin Chop
83. Top Loin Chop
84. Top Loin Chop (Bnls)

**Variety Meats**

85. Heart
86. Kidney
87. Liver
88. Oxtail
89. Sweetbread
90. Tongue
91. Tripe

**Various**

92. Beef for Stew
93. Brisket,Corned
94. Cube Steak
95. Ground Beef
96. Ground Pork
97. Hocks
98. Sausage
99. Sausage Links

**Smoked/ Cured Pork**

100. Canadian Bacon
101. Center Slice
102. Ham (Whole)
103. Ham Hocks
104. Jowl
105. Loin Chop
106. Picnic (Whole)
107. Rib Chop
108. Rump Portion
109. Shank Portion
110. Slab Bacon
111. Sliced Bacon

## PROBLEM SOLVING

Students will be given a situational problem solving the least-cost formulation of a batch of particular meat products (hamburger, wiener, bologna, etc.). This problem will be worth 50 points and consist of procedural questions and the actual determination of the least-cost price.

## GROUND BEEF FORMULATION PROBLEM TRAINING MATERIALS

Assume that you manage a meat plant that manufactures ground beef or a chain of retail stores. Your goal is to produce a fresh, wholesome product that complies with all meat inspection regulations and will have three days' shelf life in the meat case. The fat content must comply with the specifications of the stores. The cost of the product should be as low as possible.

### *Ground Beef Regulations (USDA)*

GROUND BEEF: The terms "Ground Beef" and "Chopped Beef" are synonymous. Products so labeled must be made with fresh and/or frozen beef with or without seasoning, and without the addition of fat as such, and shall contain no more than 30% fat. It may contain added water, binders or extenders. It may contain beef cheek meat not to exceed 25%. Heart meat and tongue meat are not acceptable ingredients.

If the name is qualified by the name of a particular cut, such as "Ground Beef Round" or "Beef Chuck, Ground", the product must consist entirely of meat from the particular cut or part.

### *Industry Guidelines on Ground Beef Manufacture*

1. To get the most desirable color and maximum shelf life, all boneless meats used to manufacture ground beef shall be fresh (not frozen), well chilled (temperature no higher than 35°F) and shall arrive at the plant within 96 hours of animal slaughter.

2. A least-cost determination shall be performed on acceptable meat ingredients to select those meats that produce the lowest-cost product that meets all ground beef guidelines.

3. To simplify the grinding and blending operation, only two meat ingredients will be used for each batch.

4. Rounding of decimals: 5-9 will be rounded up; 1-4 will be rounded down.

## SAMPLE PROBLEM ONE

Use the Pearson Square to formulate a batch of ground beef to the desired fat content.

Meats:
(1) Boneless cow meat (10% fat-$.99/lb.)
(2) 75% lean beef trimmings (25% fat-$.79/lb.)

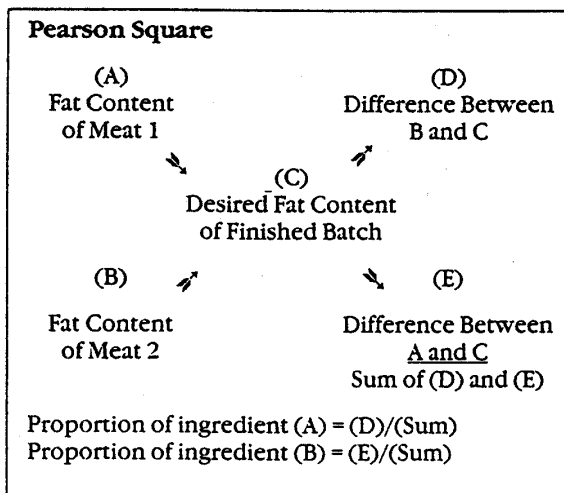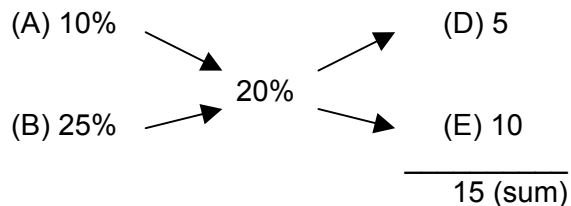Desired Final Fat Content:  20%
Batch Size:  1,000 lbs.

Determine:
  a.  The amounts of the two types of meat that must be blended together to give the desired fat content.
  b.  The meat cost of the finished product.*

*NOTE:  You will only be determining meat costs. In an actual situation overhead cost must also be added to the cost of the ground beef to account for labor, equipment, transportation, etc. In this exercise the student need not be concerned with these overhead costs.*

To simply thes grinding and blending operation, only two meat ingredients will be used for each batch.

Rounding of decimals:  5-9 will be rounded up: 1-4 will be rounded down.

**For Preceding Information:**

(A) 10%  ↘      ↗  (D) 5

20%

(B) 25%  ↗      ↘  (E) 10

──────────
15 (sum)

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**Pearson Square**

(A)
Fat Content
of Meat 1

(D)
Difference Between
B and C

(C)
Desired Fat Content
of Finished Batch

(B)
Fat Content
of Meat 2

(E)
Difference Between
A and C
Sum of (D) and (E)

Proportion of ingredient (A) = (D)/(Sum)
Proportion of ingredient (B) = (E)/(Sum)

## SAMPLE PROBLEM TWO

You must follow all government regulations and company policies listed in the training materials. Determine which available ingredients to use (and at what levels) to make the lowest-priced ground beef acceptable.

### Specifications:

Desired fat content of finished product is 18%
Batch Size = 5,000 lbs.
Manufacturing date = February 10
No product over 5 days old may be used.
No; variety meats may be used.
No product over 35$^o$F may be used.

### Boneless Meat Ingredients Available

|  | Slaughter Date | Fat Temp | Cont. | Price |
|---|---|---|---|---|
| Bull meat | Feb.6 | 33$^o$F | 8% | $1.05 |
| Boneless Chuck | Feb. 7 | 35$^o$F | 14% | $1.00 |
| 75% lean trim | Feb. 4 | 32$^o$F | 25% | $0.75 |
| 50% lean trim | Feb. 6 | 31$^o$F | 50% | $0.55 |
| Beef chuck meat | Feb. 7 | 37$^o$F | 12% | $0.70 |
| Beef hearts | Feb. 6 | 32$^o$F | 15% | $0.35 |

### Solution:
Do all potential ingredients meet government regulations and company specifications?

| Acceptable | Not Acceptable |
|---|---|
| Bull meat | 75% lean trim (too old) |
| Boneless chuck | Chuck meat (too warm) |
| 50% lean trim | Beef hearts (not allowed) |

Therefore, to produce desired fat content, product could be made from either of the following two combinations:

(1)     Bull meat and 50% lean trim
(2)     Boneless chuck and 50% lean trim
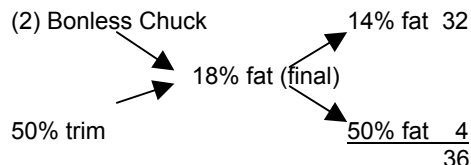
Which combination results in the lowest meat cost?

(1) Bull meat                       8% fat  32
          18% fat (final)

50% trim                       50% fat 10
                                              42
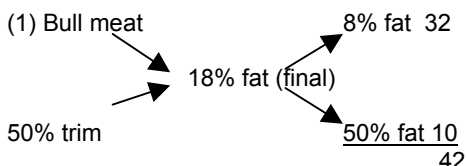
### Proportions:
Bull meat = 32/42 =     0.76 or 3,800 lbs.
50% trim = 10/42 =     0.24 or 1,200 lbs.
                                   5,000 lbs.

### Costs:
Bull meat   0.76 x $1.05 =  $0.798
50% trim    0.24 x $.55 =   $0.132
                                    $0.93 or $.93/lb.

(2) Bonless Chuck                   14% fat  32
          18% fat (final)

50% trim                       50% fat   4
                                              36

### Proportions:
Boneless chuck = 32/36 =  0.89     or 4.450 lbs.
50% trim = 4/36 = 0.11             or    550 lbs.
                                       5,000 lbs.

### Cost:
Bull meat   0.89 x $1.00 =  $0.89
50% trim    0.11 x $.55 =   $0.06
                                    $0.95 or $.95/lb.

### Final Solution --Meats to be Used:

Bull meat        3,800 lbs.
50% trim         1,200 lbs.

Meat costs:   $0.93 per pound

### *Scoring:*
The answer to the formulation problem will count ten points.  There will be an additional eight questions, worth five points each.  To facilitate computer scoring of this exercise, participants will be given a list of ten or more meat price combinations and be required to select the correct one, based on the above calculation.  All problems will be worked to three decimal places and rounded to two places.  If the third decimal is 5 or more, the number will be rounded up.

Answers to the eight additional questions will be selected from four choices.

### SAMPLE TEST ITEMS FOR SAMPLE PROBLEM TWO
Check the correct solution:

| | | |
|---|---|---|
| 1. | Bull and chuck meat | (0.89) |
| 2. | Boneless chuck and 75% lean trim | (0.91) |
| 3. | Bull meat and 50% lean trim | (0.93) |
| 4. | Boneless chuck and 50% lean trim | (0.90) |
| 5. | Bull meat and 50% lean trim | (0.88) |
| 6. | Beef hearts and 75% lean trim | (0.68) |
| 7. | Bull meat and 50% lean trim | (0.97) |
| 8. | Beef chuck meat and bull meat | (1.04) |
| 9. | 75% lean trim and 50% lean trim | (0.67) |
| 10. | 50% lean trim and bull meat | (0.87) |